

APPENDIX B

**WATER QUALITY TESTING
FOR NEW PUBLIC WATER SUPPLY SOURCES**

KANSAS DEPARTMENT OF HEALTH & ENVIRONMENT
Division of Environment
Bureau of Water

WATER QUALITY TESTING
FOR NEW PUBLIC WATER SUPPLY SOURCES

A. ANALYTICAL REQUIREMENTS FOR NEW SOURCES

1. Background

This memorandum defines the Bureau of Water's policy regarding water quality test results which must be submitted with public water supply permit applications for new sources. The intent of this policy is to insure the public water supply systems (PWSS) conform with the primary drinking water standards and monitoring requirements, and the public is supplied with water safe to drink. This memorandum specifically applies to community water supply systems and non-transient non-community water supply systems as defined in Kansas Administrative Regulation (KAR) 28-15-11. For transient non-community systems, the only analytical requirement for new groundwater sources is nitrate. However, KDHE may request additional samples be collected from new sources for analysis for other parameters by the KDHE laboratory at no charge to the transient non-community system.

2. Regulations

KAR 28-15-13 lists maximum contaminant levels (MCL) or primary drinking water standards applicable to all PWSSs. In addition KAR 28-15-14(b) and (c) provide monitoring requirements for PWSSs. KAR 28-15-16 sets forth permit requirements for PWSSs. Such permit requirements include the submittal of sufficient data on the raw water to insure that the proposed treatment facilities will produce a potable water to meet the requirements of KAR 28-15-13. Paragraph (e) of KAR 28-15-16 requires every new source of supply, either surface water or groundwater, to be analyzed for the chemical and radiological constituents of KAR 28-15-13 by the KDHE laboratory. However, Kansas Statutes Annotated (KSA) 65-171(1) indicates this analytical work may also be completed in a laboratory certified by the Secretary of KDHE. KSA 65-163 allows the Secretary of Health and Environment to require "...such other data and information as may be required..." in addition to the very specific state permit requirements, as part of an application for a public water supply permit.

KAR 28-15-13 includes monitoring requirements recently promulgated by the US Environmental Protection Agency (USEPA) under the Safe Drinking Water Act amendments of 1986, commonly referred to as Phase II/V Rules. See 56 FR 3526 (Jan. 30, 1991), 56 FR 30266 (July 1, 1991), and 57 FR 31776 (July 17, 1992). The Phase II rule includes 38 inorganic (IOCs) and synthetic organic (SOCs) contaminants. The monitoring requirements became effective on July 30, 1992 for 33 of the 38 contaminants and on January 1, 1993 for the additional five contaminants. The Phase V rule became effective on July 17, 1992, regulating an additional 23 contaminants.

It is important that new sources of supply be monitored for the Phase II/V contaminants to insure the addition of the new source will not result in an exceedance of a maximum contaminant level or trigger increased monitoring requirements.

3. Required Analyses

Site selection and construction of new public water supply wells must insure compliance with primary drinking water standards. Specific analytical requirements for new sources are attached. A table listing container and preservation requirements for constituents is also provided. Normal procedure dictates a sample be collected from a test well at the proposed site, required analyses completed, and results submitted with the permit application, plans, and specifications. Except as noted below, the Bureau of Water will not approve the construction of a well or authorize the use of a new surface source until such analyses have been provided.

Required analyses may be performed by any laboratory certified by KDHE as provided in KSA 65-171(1). Analyses may also be obtained through the KDHE laboratory. For community water supply systems and non-transient non-community water supply systems, the KDHE laboratory will provide required analyses for a charge. For information on certified laboratories, acceptable analytical methodology, or requesting sample bottles for analyses, contact the Bureau of Water at (913) 296-5514. If samples are to be analyzed by the KDHE laboratory, the Bureau of Water must be contacted at least 10 days prior to the anticipated sampling date and provided well location information.

For new groundwater sources, an initial partial inorganic chemical analysis may be completed on test holes to determine the preferred site for development of the new well. Relevant parameters for this initial screening include calcium, magnesium, sodium, total alkalinity, chloride, sulfate, iron, manganese, nitrate, and total hardness. The analyses for the initial screening may be conducted in the field utilizing portable laboratory kits equipped with a spectrophotometer, available from several laboratory equipment supply companies. If the test hole encounters separate aquifers of potentially differing water quality, each aquifer should be sampled for at least the partial inorganic chemical analysis. If a separate aquifer is determined to be of poor quality, such as a shallow alluvial aquifer with elevated sulfate levels, the water supply well must be designed and constructed as to adequately seal off that particular aquifer to prevent contamination of the lower aquifers and the well.

Once the preferred site has been identified, samples must be obtained from a site-specific test well and analyzed for all required parameters to insure compliance with the drinking water standards. The test well should be located as close as possible to the site of the proposed well (preferably within 50 feet) and the water samples collected from the same aquifer that will be screened in the production well. If after completing a suitable test drilling program in the area, the water system is unable to locate a source of supply which meets the drinking water standards, a conference may be held with KDHE, the PWSS, and the engineer and/or well driller for the purpose of determining options for the water system such as locating a new source, blending, treatment, or connection to adjacent supplies.

4. Offset Wells

If the PWSS proposes to construct an additional or replacement well in the same aquifer as an existing public water supply well and the proposed well will be

located within 300 feet of the existing well, chemical analyses of a recent sample from the existing well or the relevant point of entry to the distribution system may be submitted to KDHE for approval as satisfying new source water quality testing requirements provided the results are current and proper analytical methods were utilized. However, the overall water quality of the additional/replacement well may vary significantly from the existing well depending on many factors including differences in well construction such as depth of screen or the presence of zones of dissimilar quality within the aquifer. Where there are potential water quality concerns such as elevated nitrates, iron, and manganese, or potential significant variation in the formation, KDHE recommends additional investigative activities such as the drilling of a test well and sampling for at least a partial mineral analysis and any other parameter of concern.

5. Other Considerations

Drilling of test wells does not require prior approval of KDHE. However, test wells must be drilled, completed, properly abandoned, and plugged in conformance with KAR 28-30-1 to 28-30-10. Test wells must be provided with a temporary, water-tight cap until completion into a production well or plugging.

Groundwater quality may differ significantly over short distances. Even if water samples are obtained from a test well in compliance with these procedures and current standards, it is still possible that the water from the completed well may exceed drinking water standards for certain constituents which would require blending, treatment, or other methods to achieve compliance.

B. RECOMMENDED SAMPLING PROCEDURES

1. Background

All new sources of public water supplies must be tested for chemical quality in accordance with Kansas Administrative Regulations and this policy memorandum. It is imperative the samples obtained for analyses be representative of the source. This section provides general information to achieve this purpose. It is not intended to be a comprehensive treatment of all potential sampling issues. For additional information, see the references.

Precautions must be taken to insure representative samples of groundwater are collected from test wells. The degree and type of effort and care that goes into a sampling event is dependent on the chemical species of interest and the concentration levels of concern. The objective of this sampling effort is to obtain representative samples to determine if the water will meet primary drinking water standards, MCLs. These standards include stringent limits for several volatile organic compounds (VOCs), synthetic organic compounds (SOCs), and heavy metals. Analytical instruments measure many such parameters to the part per billion level. Improper sampling techniques or seemingly insignificant contamination of samples can drastically affect test results and potentially lead to a characterization of a source as exceeding one or more of the primary drinking water standards or MCLs.

2. Well Construction Considerations

The following well drilling recommendations are provided to reduce the potential of contamination of water samples:

- a. The drill rig and all items that will be introduced into the bore hole must be thoroughly washed with hot potable water or steam prior to the drill rig entering the drilling site. The water pump and drilling rig plumbing system must be thoroughly flushed.
- b. All casing including screened sections must be washed with a low-sudsing, non-phosphate detergent such as Alconox and thoroughly rinsed prior to introduction in the bore hole.
- c. Lubricating oils or solvents should not be used on the drill rod threads.
- d. All drilling fluids shall be obtained from a potable water supply source. Sodium bentonite is acceptable for a drilling fluid mud. The use of some organic drilling fluids, such as polymeric additives, may enhance biological activity in the aquifer and should be avoided.
- e. A temporary casing should be installed in the test well where the formation is not stable enough to support the bore hole. Specifications for the installation of a temporary casing and screen can be found in *The Engineers' Manual for Water Well Design*, Roscoe Moss company, Los Angeles, CA (1985). These specifications (§8.1.3) provide for the contractor drilling into the zone to be sampled. A section of 4-1/2" to 6" OD well screen is set connected to a drill pipe or 6" diameter threaded and coupled pipe. Formation stabilizer material (gravel) is tremied into the bore hole annulus until it extends above the screen. Three to five feet of fine sand is tremied on top of the gravel, followed by drilling mud to seal the sand.

The USEPA *Manual of Water Well Construction Practices*, EPA 570/9-75-001 includes a specification (§45.000-000-100) for the installation of an assembly for water sampling in unconsolidated formations which consists of a wound screen 2 feet in length set opposite each potential aquifer. Gravel is placed around the screen or clear water is pumped via reverse normal flow through the screen to cause the formation to collapse on the screen. The assembly is pumped at 10 gpm, or more, until the discharge is clear and a sample collected.

- f. The use of polyvinyl chloride (PVC) adhesives should be avoided in installing a temporary casing. Milligram per liter (parts per million) levels of compounds such as tetrahydrofuran, methyl-ethyl-ketone, and toluene have been found to leach into groundwater samples from well casing sealed with PVC solvent cement.

3. Sampling Considerations

a. Purging the Well

After completion, the test well must be initially purged to remove drilling contaminants and provide a water which is characteristic of the aquifer and essentially free of turbidity. Water should not be obtained from stagnant water because the chemical/physical characteristics may differ significantly from the aquifer. Recommendations regarding the volume of water that should be purged before obtaining a representative sample vary from reference to reference. Some authorities recommend sampling after three to ten well bore volumes have been removed. A formula for calculating the minimum volume of water to be purged is the following:

$$V = 0.0408 * H * D^2$$

where,

V = the volume of water in the casing (gal)

D = the insider diameter of the casing (in)

H = the length of the water column in the casing (ft)

Another approach is to monitor the specific conductance, temperature, pH, and turbidity of the purged water until the measured values stabilize over three consecutive measurements.

Care should be taken to ensure that all of the water within the well bore is exchanged with fresh water from the aquifer. It has been reported that if a submersible pump is utilized for purging the bore hole, it may take some time for the column of water above the pump to be exchanged if the transmissivity of the aquifer is high. Often, removing all water from a bore hole is only possible if the well is pumped completely dry.

b. Sampling Devices

There are a variety of different sampling devices that can be utilized for collecting groundwater samples. The sampling equipment used must not alter or contaminate the sample. Since samples will be analyzed for trace organic chemicals, special care must be taken since conventional oil-lubricated pumps, tygon, and rubber tubing can be serious sources of contamination. The following devices are recommended for the collection of samples:

- 1) A positive pressure pump, such as a non-gas contact bladder pump where water is forced to the surface through positive pressure when operated below the well's water level, cause the least amount of alteration in sample integrity as compared to other sample retrieval methods. A positive pressure pump may be operated electrically, mechanically, or by air/nitrogen pressure. Any surface on the pump system, including all tubing or piping, that comes in contact with the sample should be made of acceptable materials as defined below. A side tap may be installed on the pump discharge pipe to permit adjustment of the sample stream to a low flow. The top, however, must not have an aerator.

A negative pressure pump where groundwater is removed from a well by suction is not recommended for collection of groundwater samples for organic analyses because such pumps may result in degassing and loss of volatile compounds. This is also true of peristaltic pumps. A suction lift pump, however, may be utilized for purging the bore hole prior to collection of the sample. Further, air lift pumps which apply air pressure to a water well to force a sample out of the discharge tube, are not recommended for collection of VOC samples. Such pumps modify the pH of the water, increase oxidation of the sample, and potentially strip volatile compounds.

- 2) One of the oldest and simplest methods of sampling water wells is the use of bailers. A bailer may be in the form of a weighted bottle or capped length of pipe on a rope or some modification thereof which is lowered and raised by hand. Bailers constructed entirely of Teflon have been manufactured specially for collecting groundwater samples for analyses. Bailers used for sampling VOCs should have a sample cock or draft valve in or near the bottom of the sampler allowing withdrawal of a sample from the well below the exposed surface of the water. Suspension lines for bailers should be kept off the ground and free of other contaminating materials that could be carried into the test well.

Acceptable materials for sampling devices that may contact any groundwater sample are stainless steel, Teflon or other polytetrafluoroethylene (TFE), or glass. Plastics (PVC, polyethylene, or polypropylene) are an acceptable material for contacting samples when the analyses are inorganic constituents (metals, radionuclides, anions, cations) but not organic analyses. The PVC material in contact with the sample should contain only noncemented connections and be NSF approved for well casing or potable water applications.

All sampling equipment that may contact the sample must be cleaned prior to and after each use. Pumps or bailers require cleaning of internal and external parts prior to being lowered into the well. Equipment should first be washed with clean tap water, nonphosphate detergent, and rinsed with clean tap water. Pumps may be cleaned by pumping 2 liters of the detergent solution through the pump and lines followed by a clean rinse. The exterior of the pump and lines should also be cleaned with the detergent solution. A final rinse with organic-free, distilled/deionized water completes the cleaning.

A potential problem with sampling from an open bore hole is that the sample of water is a composite sample from the full aquifer thickness. Samples can be collected from specific horizons in an open bore hole by the use of a packer pump arrangement or straddle packer sampler. These methods utilize expandable "packers" to isolate a sampling unit between two packers within a bore hole or well. The packers are deflated for vertical movement within the well and inflated when the desired depth is attained. The packers are usually constructed from rubber. Various sampler devices including submersible pumps can be situated between the packers. The straddle packer sampler assembly comprises an axial pipe on which are mounted two inflatable rings at a fixed spacing. The rings are inflated by air line or water lines from the surface.

c. Sample Container and Preservation Requirements

The certified laboratory selected to analyze the samples must be contacted to obtain appropriate instructions and sample containers. Table 1 provides a summary of the type and minimum size of the sample containers (provided by the KDHE laboratory), preservation, and maximum holding times for the required chemical analyses. All groundwater samples shall be labeled and sealed and immediately placed in 4°C (40°F) coolers with securely closed lids for storage and transport. Samples must be received by the analytical laboratory in sufficient time to conduct the requested analyses, within 24 hours of collection.

The following paragraphs describe specific sample container requirements as determined by the KDHE laboratory. If the containers are received from the KDHE laboratory, they will have already been properly cleaned and prepared with special cleaning solutions. Additional cleaning of the bottles should not be conducted in the field because of the possibility of sample contamination or loss of preservative. The caps of the container/bottles should be kept on at all times until sample collection.

A sample preservative will have been placed in some of the containers/bottles by the laboratory prior to shipment. This preservative is important for stabilizing the sample and preventing biological growth prior to analysis. This preservative should not be poured out or the container/bottles rinsed prior to sample collection. For some containers, the laboratory may provide the sample collector with the necessary preservative in a small vial for addition to the container after filling three quarters full with water. These preservatives are typically strong acids and extreme care should be taken to avoid contact with the skin. Eye protection should be worn. The instructions from the laboratory should be carefully followed to avoid a sample being determined invalid.

Each sample bottle should be individually filled and recapped prior to filling another sample bottle. This will reduce the possibility of cross-contamination of one sample bottle with another via spillage or interchange of bottle caps. The samples should not be filtered in the field prior to collection. The laboratory may require the filling of additional containers for quality control purposes.

- 1) Metals - The sample container for metals is a 250 ml high density linear polyethylene jar with an air-tight cap. It should contain a sample preservative, nitric acid, in sufficient quantity to lower the pH of the sample below 2 s.u.
- 2) Mineral Analyses and Miscellaneous Parameters - The sample container for the mineral analysis and miscellaneous parameters is a 1 liter cube container. A 250 ml polyethylene jar may be substituted for the cube container. These containers should not contain a preservative.
- 3) Radionuclides - Sample containers for radiological analyses (gross alpha particle activity and combined radium 226 and 228) may be a 2-liter plastic bottle, or a one gallon plastic jug with an air-tight cap. In addition, there will be a 20 ml glass vial. The large

plastic bottle or jug should contain a nitric acid solution for lowering the pH of the sample below 2 s.u.

- 4) Volatile Organic Analyses (VOCs) - The container provided for VOC analyses is a 40 ml glass vial. An additional vial may be provided by the laboratory for quality control purposes. Extreme care must be exercised in collecting the VOC sample. Prior to obtaining the VOC sample, the sample collector should thoroughly wash and rinse his/her hands. The VOC vial should not be opened in the presence of fuel vapors. To collect the sample, remove the cap and Teflon lined septum (cap liner) from the vial making sure not to contaminate the inside of the cap. Contact with air and sample agitation should be minimized. If necessary, pumping rates should be significantly reduced during sampling for VOCs. Fill the vial to overflowing directly from a positive-pressure pump discharge port or bailer and place the vial on a flat surface. Float the Teflon lined septum on top of the water in the vial, with the Teflon side (white side) in contact with the water. Screw cap on tightly, but not too tightly, since the cap will crack if excessive force is applied. Turn the vial upside down, tap lightly, and observe for air bubbles. If air bubbles are present, discard the sample. If a preservative or chlorine quenching agent has been added to the vial, obtain a new vial and repeat the sample collection procedure.
- 5) Synthetic Organic Chemicals (SOCs) - The containers for the complete SOC analysis consists of three 1 liter amber glass bottles with Teflon-lined screw caps and one 120 ml glass bottle. These bottles may contain a chlorine quenching agent. An additional bottle may be provided for laboratory quality control purposes. One of the samples collected in a 1 liter amber glass bottle should be preserved with hydrochloric acid (for PNA's, phthalates, and adipates analyses). In addition to the 1 liter bottles, a 120 ml glass bottle with Teflon-lined silicone septum and screw cap will be provided for sample collection for carbamate analysis. The sample collected in the 120 ml glass bottle should be preserved with a chloroacetic acid buffer.

d. Documentation

Once each of the sample bottles is properly filled, it should be labeled with the name of the collector, time and date of collection, sample identification number or source, e.g. test well number, PWSS name, PWSS Account Number, and other pertinent information. A sample collection form must be completed also and returned with the samples. The legal description of the test well should be indicated on the form by quarter and eighth sections, range, and township. Samples should be returned to the laboratory within 24 hours of sample collection. After receipt of the samples by the KDHE laboratories, test results may be reported within one to six weeks depending upon the test requested.

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ANALYTICAL REQUIREMENTS FOR NEW SOURCES

| | ug/l or ppb | |
|-----------|-------------|------|
| Metals | | |
| Antimony | 6.0 | MCL |
| Arsenic | 50.0 | MCL |
| Barium | 2,000 | MCL |
| Beryllium | 4.0 | MCL |
| Cadmium | 5.0 | MCL |
| Chromium | 100.0 | MCL |
| Mercury | 2.0 | MCL |
| Nickel | 100.0 | MCL |
| Selenium | 50.0 | MCL |
| Thallium | 2.0 | MCL |
| Lead | 15.0 | MCL |
| Copper | 1,300.0 | MCL |
| Calcium | --- | --- |
| Magnesium | --- | --- |
| Sodium | --- | --- |
| Iron | 300.0 | SMCL |
| Manganese | 50.0 | SMCL |
| Potassium | --- | --- |

| Mineral Analysis | mg/l or ppm | |
|------------------------|-------------|------|
| Fluoride | 4.0 | MCL |
| Nitrate (as N) | 10.0 | MCL |
| Nitrite (as N) | 1.0 | MCL |
| Chloride | 250.0 | SMCL |
| Sulfate | 250.0 | SMCL |
| pH | 6.8-8.5 | SMCL |
| Specific Conductance | | |
| Total Dissolved Solids | 500.0 | SMCL |
| Total Alkalinity | | |
| Total hardness | | |
| Turbidity | | |

| | pCi/l |
|----------------------------------|-------|
| Radiological Contaminants | |
| Gross Alpha Particle Activity | 15.0 |
| Combined Radium 226 and 228 | 5.0 |

If gross alpha exceeds 5 pCi/l, analysis for uranium must be done.

If gross alpha minus uranium exceeds 5 pCi/l, analysis for radium 226 must be done.

If radium 226 exceeds 3 pCi/l, analysis for radium 228 must be done.

"MCL" refers to Maximum Contaminant Level as established in 40 CFR Part 141.

"SMCL" refers to Secondary Maximum Contaminant Level as established in 40 CFR Part 141. SMCLs are not currently enforced in Kansas.

"—" indicates an MCL has not been established yet for this parameter but other regulatory limits or health advisories may apply.

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ANALYTICAL REQUIREMENTS FOR NEW SOURCES

| VOCs | ug/l or ppb | | SOCs | ug/l or ppb | |
|----------------------------------|-------------|-----|--|-------------|-----|
| Method 524.2 - Volatile Organics | | | Method 507/508 - Chlorinated Pesticides | | |
| Benzene | 5.0 | MCL | Alachlor | 2.0 | MCL |
| Vinyl chloride | 2.0 | MCL | Atrazine | 3.0 | MCL |
| Carbon Tetrachloride | 5.0 | MCL | Chlordane | 2.0 | MCL |
| 1,2-Dichloroethane | 5.0 | MCL | Endrin | 2.0 | MCL |
| Trichloroethylene | 5.0 | MCL | Heptachlor | 0.4 | MCL |
| P-Dichlorobenzene | 75.0 | MCL | Heptachlor Epoxide | 0.2 | MCL |
| 1,1-Dichloroethylene | 7.0 | MCL | Lindane | 0.2 | MCL |
| 1,1,1-Trichloroethane | 200.0 | MCL | Methoxychlor | 40.0 | MCL |
| O-Dichlorobenzene | 600.0 | MCL | PCBs | 0.5 | MCL |
| Cis-1,2-Dichloroethylene | 70.0 | MCL | 1016 | | |
| Trans-1,2-Dichloroethylene | 100.0 | MCL | 1221 | | |
| 1,2-Dichloropropane | 5.0 | MCL | 1232 | | |
| Ethylbenzene | 700.0 | MCL | 1242 | | |
| Monochlorobenzene | 100.0 | MCL | 1248 | | |
| Styrene | 100.0 | MCL | 1254 | | |
| Tetrachloroethylene | 5.0 | MCL | 1260 | | |
| Toluene | 1000.0 | MCL | Simazine | 4.0 | MCL |
| Xylene | 10000.0 | MCL | Toxaphene | 3.0 | MCL |
| Dichloromethane | 5.0 | MCL | Hexachlorobenzene | 1.0 | MCL |
| 1,1,2-Trichloroethane | 5.0 | MCL | Aldrin | --- | --- |
| 1,1,4-Trichlorobenzene | 70.0 | MCL | Butachlor | --- | --- |
| Chloroform (THM) | --- | --- | Dieldrin | --- | --- |
| Bromodichloromethane (THM) | --- | --- | Metolachlor | --- | --- |
| Bromoform (THM) | --- | --- | Metribuzin | --- | --- |
| Chlorodibromomethane | --- | --- | Propachlor | --- | --- |
| Chlorobenzene | --- | --- | | | |
| M-Dichlorobenzene | --- | --- | Method 515.1 - Chlorinated Acid Pesticides | | |
| Dibromomethane | --- | --- | 2,4-D | 70.0 | MCL |
| 1,1-Dichloropropene | --- | --- | 2,4,5-TP | 50.0 | MCL |
| 1,1-Dichloroethane | --- | --- | Pentachlorophenol | 1.0 | MCL |
| 1,1,2,2-Tetrachloroethane | --- | --- | Dalapon | 200.0 | MCL |
| 1,3-Dichloropropane | --- | --- | Dinoseb | 7.0 | MCL |
| Chloromethane | --- | --- | Picloran | 500.0 | MCL |
| Bromomethane | --- | --- | Dicamba | --- | --- |
| 1,2,3-Trichloropropane | --- | --- | | | |
| 1,1,1,2-Tetrachloroethane | --- | --- | Method 525.2 - PNA's, Phthlates, Adipates | | |
| Chloroethane | --- | --- | Benzo(a)pyrene | 0.2 | MCL |
| 2,2-Dichloropropane | --- | --- | Di 2-Ethylhexyl Adipate | 400.0 | MCL |
| O-Chlorotoluene | --- | --- | Di 2-Ethylhetyl Phthalate | 6.0 | MCL |
| P-Chlorotoluene | --- | --- | Hexachlorocyclopentadi | 50.0 | MCL |
| Bromobenzene | --- | --- | | | |
| 1,3-Dichloropropene | --- | --- | Method 531.1 - Carbamates | | |
| | | | Aldicarb | 3.0 | MCL |
| | | | Aldicarb Sulfoxide | 4.0 | MCL |
| | | | Aldicarb Sulfone | 2.0 | MCL |
| | | | Carbofuran | 40.0 | MCL |
| | | | Oxamyl | 200.0 | MCL |
| | | | Carbaryl | --- | --- |
| | | | 3-Hydroxycarbofuran | --- | --- |
| | | | Methomyl | --- | --- |

MCL refers to Maximum Contaminant Level as established in 40 CFR Part 141

Method references are contained in Methods for Determination of Organic Compounds in Drinking Water, EPA/600/4-90/020, July, 1990, Environmental Systems Monitoring Laboratory, Cincinnati, OH 45268

--- indicates an MCL has not been established yet for this parameter but other regulatory limits or health advisories may apply.

